

## NEW OR LITTLE-KNOWN WESTERN BEES

BY T. D. A. COCKERELL

*Andrena campbelli* Cockerell, sp. n.

Male. Length about or nearly 9 mm., anterior wing 7 mm.; a species closely allied to *berkeleyi* V. and C., the males with short thick flagellum, red beneath except at base, the basal nervure going conspicuously basad of nervulus, the apical plate of abdomen broad and hatchet-like, and the sides of sixth sternite strongly dentiform. It differs from the description of *berkeleyi* thus: clypeus light lemon-yellow except the spots and apical margin; very small elongate lateral marks next to clypeus on each side; tergites 2 to 4 with very distinct white hair-bands, that on the second narrowest; scutellum closely punctured, not strongly shining; tegulae practically black in front, posteriorly red; stigma narrow, pale greyish, somewhat reddish, with heavy dark margin; second cubital cell receiving first recurrent nervure distinctly beyond middle; second tergite in middle depressed considerably less than half, but much more than a third. It is also very near to *A. lamellicauda* Ckll., but smaller, with clear white bands on abdomen and basal nervure going well basad of nervulus. Also the stigma is quite differently colored. The abdominal structure is rather suggestive of *A. robertsonii* D.T., which is however a very different insect.

Colorado; Boulder, May 21, 1933 (H. W. Campbell). There is perhaps some affinity with *A. asiatica* Friese (Amanusgab, Jariboschi), the male of which is large; face marks very pale yellow, lateral marks very small; wings dark reddish brown; basal nervure going far basad of nervulus; second cubital cell higher than long, receiving recurrent nervure a little below middle; third cubital cell long; abdomen with white hair-bands (interrupted on tergites 2 and 3), and red hair at apex. This account is based on a specimen in the American Museum of Natural History. Two other species with small lateral face-marks placed obliquely next to clypeus, are *A. erythrocnemis* Morawitz and *A. pallitarsis* Pérez, but these are small species, the anterior wing is less than 7 mm. and the basal nervure meets nervulus in *erythrocnemis* and falls short of it in *pallitarsis*. Compared with *A. bridwelli* Ckll., *A. campbelli* is easily known by the face being not so broad and the clypeus high, quite a different shape.

*Andrena physariæ* Cockerell, sp. n.

Female. Length about 10 mm., anterior wing 7.7 mm.; black, including mandibles antennæ and legs, the tarsi rufescent at apex; third antennal joint somewhat longer than next two combined, its length about 430 microns; front vertically striate; facial fovæ narrow, pale reddish, separated from orbit only by a shining line; clypeus dull and granular at sides, but the broad disc flattened, almost concave, polished, with strong scattered punctures; process of labrum truncate, with dorsal pit; mesothorax dull in front but broadly shining on disc, with distinct, not very dense, punctures; scutellum shining, finely punctured; area of metathorax triangular, dull; hair of head and thorax red, paler on head (pale fulvescent on cheeks) but rich fox-red on thorax above, especially bright on scutellum and postscutellum, but anterior part of scutellum broadly bare; tegulæ black; wings hyaline, faintly yellowish, the broad outer margin conspicuously dusky; stigma well developed, light ferruginous, without a dark margin; nervures of basal part of wing dark, but from level of stigma on very pale reddish; basal nervure falling a little short of nervulus; second cubital cell moderately broad, narrowed above, receiving recurrent nervure distinctly before middle; legs with pale reddish hair, but greyish, not at all brilliant, on inner side of hind tarsi; middle basitarsi large and very broad, on inner side with a large oval blackish area; hind basitarsi broad; spurs light red; hind tibial scopa pale red; abdomen shining, very finely but distinctly punctured; second tergite in middle depressed more than a third but less than a half; first tergite with margin all black with no red hair band; tergites 2 to 4 with rather broad very distinct pale fulvous hair-bands, interrupted in middle on second; caudal tuft clear red.

Colorado; Boulder, at flowers of *Physaria didymocarpa*, May 21, 1933 (H. W. Campbell). A distinct species separable from several similar ones as follows (females):

|  |           |                              |
|--|-----------|------------------------------|
| Middle of clypeus dull, not polished                               | . . . . . | 1                            |
| Middle of clypeus conspicuously polished                           | . . . . . | 2                            |
| 1. Mesothorax dull   | . . . . . | <i>brachycarpæ</i> V. and C. |
| Mesothorax highly polished   | . . . . . | <i>auricoma</i> Smith        |
| 2. Facial fovæ broad   | . . . . . | 3                            |
| Facial fovæ very narrow (as in <i>auricoma</i> )                   | . . . . . | 4                            |
| 3. Clypeus with strong punctures in middle                         | . . . . . | <i>coloradina</i> V. and C.  |
| Clypeus impunctate in middle                                       | . . . . . | <i>pronitens</i> Ckll.       |
| 4. Hind tibiæ and tarsi clear red; clypeus not flattened in middle | . . . . . | <i>speculifera</i> Ckll.     |
| Hind tibiæ and tarsi not red; clypeus flattened in middle          | . . . . . | <i>physariæ</i> Ckll.        |

*Andrena* (*Conandrena*) *angustifrons* Cockerell, sp. n.

Female. Length about 10 mm., anterior wing nearly 8 mm.; black, including mandibles antennæ and legs, the tarsi obscurely rufescent apically; eyes long and narrow, black; facial quadrangle long and narrow, much longer than wide; clypeus shining and sparsely punctured, the middle somewhat flattened with no trace of a ridge; malar space very short but not linear; process of labrum very broadly truncate, subemarginate, the labrum with much red hair; second joint of maxillary palpi longest, about 270 microns, last joint 175; blade of maxilla very broad; third antennal joint 335 microns long, fourth 175, fifth 190; facial foveæ narrow, creamy white, close to eye; vertex very narrow, shining on each side of ocelli; hair of head and thorax very pale dull fulvescent, more distinctly reddish on scutellum; mesothorax shining on disc, where it is very weakly and sparsely punctured; scutellum polished, the disc hardly punctured; area of metathorax entirely dull, hardly defined; tegulæ small, very dark reddish or brownish; wings hyaline, slightly yellowish, the apical region distinctly though not deeply infuscated; stigma and nervures (except the subcostal) clear bright ferruginous; stigma well developed, pointed apically; basal nervure falling a little short of nervulus; second cubital cell very narrow, receiving the recurrent nervure near its end; third cubital cell long; legs with pale reddish hair, hind knee-tuft pale fulvescent; hair on inner side of hind tarsi nearly white; the copious scopa of hind legs reddish posteriorly; abdomen dullish, very finely and distinctly punctured, the first tergite more shining; second tergite in middle depressed rather more than a third; first tergite with no hair-band but a small spot of hair on each side; tergites 2 to 4 with very broad dull white hair-bands; margin of fifth and apex with light orange-fulvous hair.

The pollen collected is yellowish white, the grains spherical, probably belonging to *Campanula*. Nearest to *A. cheyennorum* V. and C., from Nebraska but tarsi not ferruginous; it is perhaps no more than a local race or subspecies but the venation differs. The face is considerably narrower than in *A. bradleyi* Viereck and the foveæ are much narrower.

Idaho; Blackfoot, June 22, 1931 (Louise Ireland).

*Andrena unicola* Cockerell, sp. n.

Male. Length about 8.5 mm., anterior wing 7 mm.; black, with broad, slightly bluish abdomen; clypeus creamy white with two conspicuous black spots (which are considerably larger than in *A. amplificata*); antennæ black with the flagellum obscurely



brownish beneath, third joint a little longer than next two together; front finely, longitudinally striate; malar space very short; cheeks flattened, not produced or angular; mandibles ordinary; lower margin of clypeus black; process of labrum rounded; hair of head black, a little pale fulvous hair on occiput; thorax with abundant long pale brownish hair, a sort of very dilute fulvous, mesothorax dull, the posterior disc shining; scutellum shining anteriorly; area of metathorax entirely dull, poorly defined; tegulae shining black; wings reddish hyaline; stigma rather slender, pale fulvous with a dusky margin; nervures light brown; basal nervure falling just short of nervulus; second cubital cell not very long; legs with mainly black hair; abdomen with no hair-bands (the type carries a *Stylops* under the fourth tergite); second tergite in the middle depressed less than a third; middle of second tergite dullish with a very fine sculpture of transverse lines.

Colorado; Boulder, May 21, 1933 (W. T. McKean). Related to *A. metea* Ckll. from Wyoming but considerably smaller with hair on thorax not black, the stigma paler and the abdomen metallic. Also related to *A. amplificata* Ckll. from Steamboat Springs, Colorado, but the clypeus is not so yellow, the hair in the region of the antennae is all black, the stigma is paler and smaller, and the third cubital cell is much more extended beyond second recurrent nervure, this being due to the position of the recurrent nervure, not to the length of the cell. The abdomen is more robust than in *A. amplificata* and lacks the narrow white hair-bands at sides of tergites.

*Andrena* (*Trachandrena*) *veris* Cockerell, sp. n.

Female (type). Length 10 mm.; black, including mandibles, antennae, tegulae and legs; hair of thorax above abundant, bright ferruginous, of head and other parts of thorax also red but not so bright; head ordinary; malar space linear but distinct; process of labrum short, truncate; clypeus densely and coarsely punctured, without a smooth median line; third antennal joint much longer than fourth and nearly as long as fourth and fifth together; facial foveae reddish, rather broad, narrowly separated from orbits, hard to see on account of long overlapping red hair; a small shining space at each side of ocelli; mesothorax dull and densely punctured, only the posterior disc somewhat shining, with large coarse punctures; scutellum coarsely and densely punctured; area of metathorax large; triangular, with about eight very coarse more or less wrinkled rugae, and little ones at sides; wings greyish hyaline, the apical margin darker; stigma large, very dark reddish, nearly black, varying to dusky red; nervures fuscous; basal nervure meeting nervulus; second cubital cell broad, receiving recurrent

nervure well beyond the middle; legs with reddish hair; hind tibial scopa pale red; spurs red; abdomen broad convex, shining, with pale fulvus hair-bands at sides of second tergite, broadly interrupted in middle on third, and narrowly interrupted or practically entire on fourth; apical fimbria clear orange-fulvous; second tergite in middle depressed about or nearly two-thirds; third more than half but considerably less than two-thirds.

Male. Length 9-10 mm.; more slender; antennæ long, entirely black; third joint a little shorter than fourth, fourth conspicuously shorter than fifth; stigma dusky red with dark margin; second tergite in middle depressed less than half; stipites very broad; hind coxæ with a conspicuous tubercle at apex.

Colorado; Boulder, at flowers of *Salix*, a pair taken mating May 6, 1933 (H. W. Campbell). Three other males and a female were taken by Mr. Campbell on the same date, and Miss Helen I. Gibbons took a female in Gregory Canyon, Boulder, May 6. The female looks very like *A. cyanophila* Ckll. (a late summer species) but the mesothorax is quite different. It is very near *A. indotata* Viereck but my specimen of that (from Saskatchewan) has a red stigma and the abdominal depressions are not so broad. The male is very near *A. davisiana* V. and C. but distinguished by the second tergite; it also resembles *A. grossulariæ* V. and C. but the tegulæ and stigma are quite different. *A. tacitula* Ckll. is also allied.

*Andrena* (*Opandrena*) *cressoni transformans* Cockerell, sp. n.

Female. Very close to *A. cressoni* Robertson, agreeing in most of its characters but differing thus (comparison with a topotype *cressoni* received from Robertson): Face considerably broader (its width about 2.4 mm.); the convex clypeus shining, with very strong punctures which are largely absent in middle, especially toward the apex; mesothorax more shining, very distinctly punctured; tegulæ larger, clouded with blackish; stigma smaller and more dusky; wings hardly at all yellowish; nervures fuscous; hind basitarsus broader, pure black; hair at end of abdomen pale reddish, the hair fringing fifth tergite shining silvery.

Colorado; Boulder, June 8, 1933 (Helen P. James). I treat this as a subspecies, having only one specimen, but I suppose it to be a segregate which has taken to a different food-plant; a case similar to that of *A. parnassiæ* derived apparently from *A. peckhami*. It is at any rate readily recognizable. The type collected only a little pollen consisting of round bright lemon-yellow grains, but there are also very much smaller elongate

pale yellow grains, which might come from *Draba* or some related plant. The pollen collected by the topotype *A. cressoni* resembles the small grains referred to. According to Robertson's list *A. cressoni* is a frequent visitor to various Cruciferæ.

#### ANDRENA OPACIVENTRIS Cockerell

The type (female) is from Claremont, California, and has the abdomen perfectly opaque. One taken at Riverside, Calif., at *Salix lasiolepis* Benth., Feb. 6 (Timberlake), has the abdomen moderately shining and the hind basitarsi more slender. A specimen from Boulder, Colorado, April 15 (E. R. Becker), more closely resembles the type but the abdomen is slightly shining.

#### *Osmia angustipes* Cockerell, sp. n.

Male. Length about 8.5 mm., anterior wing 6.3 mm.; yellowish green with tegulæ and legs largely metallic; hair of head, thorax, and legs long and white, without black hairs intermixed, except on upper part of mesopleura where there is a certain amount of dark hair; abdomen with thin long white hair on first tergite, very short white hair on second, remaining tergites with mainly black hair but very thin; antennæ entirely black, flagellum quite simple, not nearly so long as in *O. integrella* Ckll.; apical tooth of mandibles long; clypeus dull and excessively densely punctured under the rather dull white beard; vertex and mesothorax dull; scutellum shining between the dense punctures with no smooth line; area of metathorax dull; wings rather strongly brownish; marginal cell with no distinct dark cloud but its apical part and beyond infuscated; basal nervure meeting nervulus; second cubital cell receiving first recurrent nervure far from base (the distance about equal to first intercubitus) and second nearer apex; tarsi not modified, the apical joint rufescent; abdomen shining olive-green, the depressed shining margins of tergites quite broad; sixth tergite with a broad notch, seventh sharply bidentate, the teeth rather close together; venter simple except that the third sternite has a V-like emargination, densely fringed with rather long pale orange hairs; stipites stout, broadly rounded at end.

Colorado; Boulder, April 21, 1833 (H. W. Campbell). In my table runs to near *O. pseudamala* Ckll., but the longer, more slender hind tibiæ readily distinguishes it from that species. It is easily known from *O. cordata* Rob. by the broad shining apical margins of tergites; from *O. simillima* Sm. it is known by the unmodified flagellum. It is very like *O. coloradensis* Cresson

but is easily separated by the black hair on apical half of abdomen and the less robust hind tibiae. The metallic legs at once separate it from *O. seneciophila* Ckll. which has similar hair on head and thorax.

SPINOLIELLA MELILOTI Cockerell

New Mexico; near Abeytas, both sexes at flowers of *Parosela scoparia*, August 26 (Timberlake).

NOMIA CALIFORNICA Cockerell

Arizona; South entrance to Petrified Forest National Monument, at flowers of *Guetierrezia sarothrae*, three females, Aug. 27 (Timberlake).

XENOGLOSSODES ERIOCARPI (Cockerell)

Idaho; Fort Hall, female, July 21 (Louise Ireland).

ANTHOPHORA TEXANA Cresson

Colorado; Denver, both sexes at purple aster, Oct. 1 (Helen Gibbons). New to Colorado.

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NOTE ON THE TARANTULA HAWK WASPS

Some observations were made, August, 1933, on two species of tarantula hawk wasps, *Pepsis chrysothemis* Lucas and *Pepsis cinnabarina* Lucas at Twenty-nine Palms, California. Whole bunches of muscat grapes had been attacked by these wasps and the juice had been sucked from them so that nothing was left but the dried skin and seeds. It is known that these insects feed on ripe figs and peaches that have fallen to the ground or upon the fruit that has previously been attacked by birds; but no record has been made, to my knowledge, of their feeding on sound grapes.

Poison liquid baits as well as poisoned fruits had been used with little or no success. The baits would soon dry out because of the dry climate, thus rendering them no longer attractive to the tarantula hawks. Ripe melons that had been cracked open were especially attractive food for the wasps, and many were trapped and killed in this manner; but their breeding ground on the desert is so extensive that little control was obtained through this method.—H. L. McKenzie, Citrus Experiment Station, Riverside, California.